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Indian Standard

SPECIFICATION FOR LOW CARBON STEEL WIRE FOR RIVETS FOR USE IN BEARING INDUSTRY

(First Revision)

UDC 669·15 — 194 — 426 : 621·884·621·822

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MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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April 1980

Indian Standard

SPECIFICATION FOR LOW CARBON STEEL WIRE FOR RIVETS FOR USE IN BEARING INDUSTRY

(First Revision)

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(*Continued on page* 8)

Indian Standard

SPECIFICATION FOR LOW CARBON STEEL WIRE FOR RIVETS FOR USE IN BEARING INDUSTRY

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 12 November 1979, after the draft finalized by the Alloy Steels and Special Steels Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 This standard was first published in 1968. On the basis of experience gained in the production and use of this steel, it has been decided to undertake revision of this standard.

0.3 The major modifications made in this revision relate to addition of cold upsetting test, and wrapping test for wire. Hardness test has been deleted as it has been found very difficult to conduct the same on such small diameter wires. Further hardness is related to tensile strength for which limits have been laid down.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the requirements for low carbon steel wire for rivets for use in bearing industry.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in relevant parts of IS : 1956† shall apply.

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*Rules for rounding off numerical values (*revised*).

†Glossary of terms relating to iron and steels (Parts I to VIII).

3. SUPPLY OF MATERIAL

3.1 General requirements relating to supply of steel wire for rivets shall be as laid down in IS : 1387-1967*.

4. MANUFACTURE

4.1 Steel shall be manufactured by open hearth, electric, acid bessemer, duplex, basic oxygen or a combination of these processes. In case any other process is employed by the manufacturer, prior approval of the purchaser should be obtained. If basic oxygen process is employed for manufacture, the nitrogen content shall not exceed 0·007 percent.

NOTE — The nitrogen content should be ensured by the manufacturer by product analysis.

4.1.1 Steel shall be fully killed. Steel may be ordered as aluminium killed or silicon killed. In case of silicon killed steel, the minimum silicon content shall be 0·10 percent.

4.2 Sufficient reduction and discard shall be made from each ingot to ensure freedom from piping, segregation and other harmful defects.

4.3 The ingots, blooms or billets shall be rough machined, chipped, ground or otherwise prepared to remove all surface imperfections likely to produce defects in the finished wire.

5. CHEMICAL COMPOSITION

5.1 Product Analysis — The wire, when analysed in accordance with relevant parts of IS : 228† shall conform to the following requirements:

Constituent	*Percent*
Carbon	0·10 *Max*
Manganese	0·30 to 0·50
Sulphur	0·040 *Max*
Phosphorous	0·040 *Max*

6. FREEDOM FROM DEFECTS

6.1 Finished wire shall be well and cleanly drawn to the required dimensions. The wire shall be sound, free from splits and surface flaws.

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*General requirements for the supply of metallurgical materials (*first revision*).

†Methods of chemical analysis of steel (*second revision*) (being issued in parts).

7. TOLERANCES

7.1 Tolerances permitted on the diameter of the wire shall be as follows:

Size, mm	*Tolerance*, mm *Max*
Up to 5	+ 0 – 0·015
Over 5 up to and including 8	+ 0 – 0·020

7.1.1 The tolerances for wire over 8 mm shall be as agreed to between the purchaser and the manufacturer.

8. PHYSICAL TESTS

8.1 Steel wire shall conform to tensile strength requirements given in **8.1.1**.

8.1.1 *Tensile Test* — The tensile strength of the steel wire when determined in accordance with IS : 1521-1972* shall be not less than 440 N/mm^2 (45 kgf/mm^2) and not more than 540 N/mm^2 (55 kgf/mm^2).

8.2 The steel wire shall also, wherever applicable, conform to the requirement of cold upsetting test and wrapping test as given in **8.2.1** and **8.2.3**.

8.2.1 *Cold Upsetting Test* — This test shall be conducted only on wires of diameter greater than 5 mm.

8.2.1.1 A test piece, having a length equal to twice its diameter, cut from the wire, shall, at room temperature withstand without fracture or shall not reveal any crack while being compressed to half its length.

8.2.2 Wire smaller than 5 mm diameter shall be subjected to wrapping test in accordance with IS : 1755-1961†. The wire shall withstand without breaking or splitting being wrapped eight times round its own diameter and subsequently straightened.

9. GRAIN SIZE

9.1 The grain size of the as received finished wire when measured in accordance with IS : 4748-1968‡ shall be 5 and above.

---

*Method for tensile testing of steel wire (*first revision*).

†Method for wrapping test of wire.

‡Methods for estimating average grain size of metals.

10. CONDITION OF DELIVERY

10.1 The wire shall be supplied in the form of coils. The weight of coils, the eye dimensions and other forms of supply shall be mutually agreed to between the purchaser and the manufacturer.

11. PACKINC AND MARKING

11.1 The packing of the material shall be done in such a way that corrosion does not attack the material during transit. The suitable mode of packing shall be mutually agreed to between the purchaser and the manufacturer.

11.2 Each coil shall be legibly marked with the nominal size of the wire, weight of the coil, date of manufacture and trade-mark or the name of the manufacturer.

11.2.1 Each coil may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

12. SAMPLING

12.1 Unless otherwise agreed to, the method of drawing representative samples of the material and the criteria for conformity shall be as given in Appendix A.

APPENDIX A

(*Clause* 12.1)

SAMPLING AND CRITERIA FOR CONFORMITY

A-1. LOT

A-1.1 In any consignment, all the coils of wires of the same diameter manufactured under essentially similar conditions of manufacture shall be grouped together to constitute a lot.

A-2. SAMPLING FOR SIZES AND FREEDOM FROM DEFECTS

A-2.1 The number of coils to be examined from each lot for checking sizes and freedom from defects and the corresponding criteria for conformity shall be as agreed to between the purchaser and the manufacturer.

A-3. SAMPLING FOR OTHER CHARACTERISTICS

A-3.1 From each lot, the number of coils specified below (depending upon the number of coils in the lot) shall be selected at random:

No. of Coils in the Lot	*No. of Coils to be Selected*
Up to 25	3
26 ,, 65	4
66 ,, 180	5
181 ,, 300	6
301 and above	7

A-3.2 A test piece cut from each end of each coil so selected shall be subjected to chemical analysis (*see* **5.1**).

A-3.2.1 The lot shall be considered as conforming to the requirements of the chemical composition laid down in this specification if every test result complies with the limits specified in **5.1**.

A-3.3 From each of the coils selected, one test piece shall be cut from each end subjected to either tensile or hardness test (*see* **8.1**, **8.1.1** and **8.1.2**). For cold upsetting test one sample shall be tested for each 10 tonnes of a cast or part thereof. One additional test shall be made for each variation in diameter.

A-3.3.1 The lot shall be considered as conforming to the requirements of the tests if each test result complies with the relevant requirement specified in the standard.

A-3.3.2 *Retest* — Should any of the test pieces first selected fail to pass any of the tests specified in this standard, two further samples shall be selected for testing in respect of each failure. Should the test pieces from both these additional samples pass, the material represented by the test samples shall be deemed to comply with the requirement of that particular test. Should the test pieces from either of these additional samples fail, the material represented by the test samples shall be considered as not having complied with this standard, except that the manufacturer may reheat-treat (not more than twice) the material represented and re-submit it for testing.

(*Continued from page* 2)

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AMENDMENT NO. 1 JANUARY 1981

TO

IS:4882-1979 SPECIFICATION FOR LOW CARBON STEEL WIRE FOR RIVETS FOR USE IN BEARING INDUSTRY

(First Revision)

Corrigenda

(*Page 5, clause 8.2, line 3*) - Substitute 'and 8.2.2' *for* 'and 8.2.3'.

(*Page 7, clause A-3.3, first sentence*) - Substitute the following for the existing sentence:

'From each of the coils selected, one test piece shall be cut from each end and subjected to tensile test (*see* 8.1.1).'

(SMDC 19)

Reprography Unit, BIS, New Delhi, India

AMENDMENT NO. 2 APRIL 1993

TO

IS:4882-1979 SPECIFICATION FOR LOW CARBON STEEL WIRE FOR RIVETS FOR USE IN BEARING INDUSTRY

(First Revision)

Alteration

(*Page 4, clause 5.1*) - Substitute the following for the existing clause:

'5.1 Product Analysis - The product analysis of wire shall be as given below. The analysis of steel shall be carried out either by the method specified in IS:228† and its relevant parts or any other established instrumental/chemical method. In case of dispute the procedure given in IS:228† and its relevant parts shall be referee method. However, where the method is not given in IS:228† and its relevant parts, the referee method shall be agreed to between the purchaser and the manufacturer:

Constituent	*Percent*
Carbon	0.10, *Max*
Manganese	0.30 to 0.50
Sulphur	0.040, *Max*
Phosphorous	0.040, *Max*'

(SMDC 19)

Reprography Unit, BIS, New Delhi, India